

WHAT IS CLAIMED IS:

1. A beam steering system, comprising:
a beam generating device, operative to generate a light beam;
an electronically modulated prism, comprising:
a bulk crystal, having a top surface, a bottom surface and a plurality of side surfaces, wherein the light beam incident on one of the side surface and emerging from another of the side surfaces;
an array of electrode pads deposited on the top surface; and
a common electrode formed on the bottom surface; and
an electric field source, operative to apply an adjustable electric field to each electrode of the array.
2. The beam steering system of Claim 1, wherein the beam generating device includes a laser device.
3. The beam steering system of Claim 1, wherein the bulk crystal is configured into a parallelepiped.
4. The beam steering system of Claim 1, wherein the top surface is parallel to the bottom surface, and the side surfaces are perpendicular to the top and bottom surfaces.
5. The beam steering system of Claim 4, wherein the side surface on which the light beam is incident is parallel to the side surface from which the light beam emerges.
6. The beam steering system of Claim 1, wherein the bulk crystal has electrically induced birefringence property.
7. The beam steering system of Claim 1, wherein the bulk crystal is made of potassium dihydrogen phosphate, potassium dideuterium phosphate, ammonium dihydrogen phosphate, cadmium telluride, lithium tantalite, lithium niobate, gallium arsenide, or zinc selenide.
8. The beam steering system of Claim 1, wherein the bulk crystal is made from a material of which the index of refraction varies proportional to the electric field applied thereto.
9. The beam steering system of Claim 1, wherein the electric field is operative to apply the electric field along a direction perpendicular to the direction along which the light beam transmits.

10. The beam steering system of Claim 1, wherein the common electrode is connected to ground.
11. The beam steering system of Claim 1, wherein the electrode pads are selectively connected to the electric field source.
12. An electronically modulated prism, comprising:
 - a bulk crystal, the bulk crystal being optically isotropic with zero electric field applied thereto and optically anisotropic when subjected to a non-zero electric field;
 - a plurality of electrode pads formed on a top surface of the bulk crystal; and
 - a common electrode plate formed on a bottom surface of the bulk crystal.
13. The electronically modulated prism of Claim 11, wherein the bulk crystal between each of the electrode pads and the common electrode has an index of refraction altered proportionally to the electric field applied thereto.
14. The electronically modulated prism of Claim 11, wherein the bulk crystal is fabricated from potassium dihydrogen phosphate, potassium dideuterium phosphate, ammonium dihydrogen phosphate, cadmium telluride, lithium tantalite, lithium niobate, gallium arsenide, or zinc selenide.
15. The electronically modulated prism of Claim 11, wherein the bulk crystal has a thickness of about 1 mm.
16. The electronically modulated prism of Claim 11, wherein the electrode pads are arranged as an array.
17. The electronically modulated prism of Claim 11, wherein the electrode pads are arranged as an orthogonal array.
18. The electronically modulated prism of Claim 11, wherein the bulk crystal includes a plurality of side surfaces perpendicular to the top and bottom surfaces.
19. The electronically modulated prism of Claim 11, wherein the electrode pads being selectively connected to an electric field to induce local variations of index of refractions at various positions of the bulk crystal.
20. An electronically modulated prism for modulating an incident beam transmitting therethrough, the electronically modulated prism being fabricated from a material operative to induce a plurality of local phase shifts of the incident beam by applying an electric field at

selected positions across the material locally, and accumulate the local phase shifts along a propagation path of the incident beam.

21. The electronically modulated prism of Claim 20, wherein the material comprises potassium dihydrogen phosphate, potassium dideuterium phosphate, ammonium dihydrogen phosphate, cadmium telluride, lithium tantalite, lithium niobate, gallium arsenide, or zinc selenide.

22. A beam steering system, comprising:
a source for generating a beam;
a prism through which the beam propagates; and
an electric field source, selectively applying an electric field at various positions across the prism locally; wherein

the prism being fabricated from a material operative to induce a plurality of local phase shifts of the incident beam at the various positions and accumulate the local phase shifts along a propagation path of the beam.

23. The beam steering system of Claim 22, wherein the electric field source is operative to generate an adjustable electric field locally at various positions across the prism.

24. The beam steering system of Claim 22, wherein the material comprises potassium dihydrogen phosphate, potassium dideuterium phosphate, ammonium dihydrogen phosphate, cadmium telluride, lithium tantalite, lithium niobate, gallium arsenide, or zinc selenide.

25. A method of steering a beam, comprising:

- a) fabricating a bulk crystal from an electro-optic material;
- b) generating an incident beam to propagate laterally through the bulk crystal;
- c) generating an electric field; and
- d) applying the electric field locally at various positions across the bulk crystal.

26. The method of Claim 25, wherein step (a) further comprising the fabricating the bulk crystal from the electro-optic material operative to induce variation of index of refraction while being subjected to the electric field.

27. The method of Claim 25, wherein step (a) further comprising the fabricating the bulk crystal from the electro-optic material selected from one of the group consisting of potassium dihydrogen phosphate, potassium dideuterium phosphate, ammonium dihydrogen

phosphate, cadmium telluride, lithium tantalite, lithium niobate, gallium arsenide, or zinc selenide.

28. The method of Claim 25, wherein step (a) further comprises the following steps:
forming a plurality of electrode pads on a first surface of the bulk crystal, wherein the first surface is parallel to a propagation path of the incident beam; and
forming a common electrode on a second surface opposing to the first surface of the bulk crystal.

29. The method of Claim 28, wherein step (d) further comprises selectively applying the electric field to the electrode pads and the common electrode across the bulk crystal.

30. The method of Claim 25, further comprising a step of adjusting the intensity of the electric field applied at various positions of the bulk crystal.

31. The method of Claim 30, further comprising independently adjusting the intensity of the electric field at each of the various positions.

32. A method of steering an incident beam, comprising:
a) fabricating a bulk crystal from an electro-optic material;
b) directing the incident beam to propagate laterally through the bulk crystal;
c) forming at least an propagating interface of the incident beam within the bulk crystal by applying an electric field with a first intensity at selected positions across the bulk crystal.

33. The method of Claim 32, wherein step (c) further comprises forming the propagating interface by applying the electric field with a second intensity different from the first intensity at unselected positions across the bulk crystal.

34. The method of Claim 32, wherein step (c) further comprises forming a plurality of propagating interfaces of the incident beam within the bulk crystal by applying the electric field with different intensities at various positions across the bulk crystal.